FOREST MANAGEMENT UPDATE

by
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For Service Foresters & Consultants

CULTURING QUALITY WHITE PINE SAWLOGS
or
WHITE PINE BRANCH MANAGEMENT[1/]

Owners of white pine pole stands who decide to manage for a sawtimber rotation should consider investing in the production of high value sawtimber. This article will address the art and science of culturing immature white pine pole stands to yield additional high quality material in the form of clear and tight red-knotted lumber.

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Expected Benefits

Studies have shown that good pruning operations can yield returns of 13 to 17 percent. If stand pruning records are maintained as evidence, it is probable that prospective buyers will bid a premium stumpage price for the additional clear and tight red-knotted lumber in crop trees. Foresters and landowners have frequently questioned the advisability of pruning due to the uncertainty that the landowner, rather than the sawmiller, will reap the return from the investment. This is a valid concern, but current changes in log purchasing practices are promising. In northern New England where markets for white pine sawtimber are long established, landowners are again witnessing markets that discriminate by grade, with prime logs being worth twice as much as grade 3 logs.

The Silvical Situation

The wood of eastern white pine is resistant to decay, an asset for the material as a product, but a silvicultural problem for foresters. Dead limbs persist on the tree for years after dying. If not pruned, they form "loose black knots", a serious degrade, causing that portion of the bole to produce the lowest grade and least marketable lumber. If limbs are still alive at the time of harvest, they form "tight red knots" in the log. While lumber from this portion of the tree is usually not as valuable as clear, it is still desirable for furniture stock, paneling, trim, etc., especially if the knots are not excessively large.

Branch Management

The culturing of crop trees to produce high value lumber requires "branch management". The objective is: to minimize the portion of the tree containing persistent dead branches and to control the size of live branches. This will produce clear lumber in the pruned butt log, and tight red-knotted lumber in the upper unpruned portion of the bole.

The art of branch management must be practiced by regulating stand density. Branches in the live crown should be kept relatively small (less than 4 inches) to control the size of the tight red knots. Branch size may be controlled by adjusting density to provide adequate sunlight for full live crown development while maintaining sufficient shade on the lower crown to restrict branch growth. Generally, stands cultured using the branch management concept are thinned to lower densities, which produces a more open appearance. Crop trees will develop wider and deeper crowns.

In some areas, certain precautions are warranted when applying these principles of branch management. At this time we do not know the precise stocking level that will provide the optimum environment for quality crop trees. However, we do know it will be below the B level and possibly below the C level on the white pine stocking chart. What does that mean? With this lower density, the site will produce less total volume, although hopefully it will have a higher unit value. The lower density also creates conditions that are more favorable to the establishment of less desirable hardwoods in the understory. That could increase site preparation costs if white pine is to be perpetuated into the next rotation.

Where the white pine weevil is a problem, branch management may be complicated by the need to maintain a high stand density or overhead cover until the crop trees have grown taller than the anticipated pruning height. Densely stocked weevil infested stands will have fewer stems with severe crook than low density stands. Branch size will be smaller in dense stands and in stands that have developed under an overstory. However, these conditions (high density and overhead cover) may restrict the development of crowns so potential crop trees are less able to respond quickly when they are released.

Crop Tree Selection

A critical step in culturing quality white pine is the selection of crop trees to be pruned and kept free to grow. Prunable crop trees must have well developed crowns to be effective competitors and permit rapid tree growth. Pruned trees must grow rapidly to produce a sufficient quantity of clear high value lumber that will earn the premium stumpage price needed to justify the pruning investment. Fast growing crop trees can quickly overgrow branch stubs. Prunable crop trees should have small branches (less than 1.5 inches). Large branches are more expensive to prune, and they are more likely to contain heartwood that does not seal over with pitch when the branch is cut. Exposed heartwood is a potential pathway for heartrot fungi. Prunable trees should have straight boles to avoid defect caused by crook and sweep. In the Lake States and the Northeast where the white pine weevil is a pest, crook caused by this insect can be a serious degrade.

Sometimes when selecting crop trees the three objectives underlined above are conflicting and a choice must be made between a perfectly straight tree with small branches and a small crown, and one with larger branches, a large crown, and some slight crook. Within reason, a well developed crown is a more critical crop tree selection criteria than small branch size or slight crook.

Pruning

When pruning crop trees, the stand should be kept open enough to promote rapid crop tree growth and prevent the death of branches above the pruned butt log. The maximum stocking level that will keep the lowest branches of the crown alive is affected by the height to which crop trees are pruned. The higher the trees are pruned, the more dense the stand can be and still provide enough light on the lower limbs to keep them alive.

The upper portion of the pruned log is the most difficult and expensive to treat. It is awkward to prune with a pole saw at a height greater than 22'. Frequently, experienced pruners avoid the pole saw and carry a light ladder. The ladder operation may be made safer and more efficient by modifying the ladder with a curved, padded top step that fits the circular shape of trees. Spikes on the ladder feet also increase its stability.

Whenever branches are pruned, it should be done using techniques described in an article by Alex Shigo in the Spring 1982 issue of Forest Notes. Copies are available from the USDA-Forest Service, Arlyn W. Perkey, P.O. Box 4360, Morgantown, West Virginia 26505.

Product Length

Foresters frequently prune to either 13' or 17' which allows for 12' or 16' logs with 1' remaining for trim and stump height. The production of 8' or 16' logs has no special significance for the white pine retail lumber market since the wood is not commonly used as construction lumber. Logs are generally cut to any even numbered length ranging from 8' to 16'.

1/ Article prepared by Arlyn W. Perkey based primarily on information presented by Dave Smith and Dave Buxton at the White Pine Symposium on June 12-14, 1985.

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THE SAW VS. THE SHEAR: IMPACT ON REGENERATION[2/]

The Questions

Q1: Will planted pines survive better in sheared areas than in chainsaw cut areas?

Q2: Does the harvesting method (chainsaw or shearing) affect the quality of hardwood sprouts?

Q3: Does a sheared stump receive chemical treatment more or less readily than a chainsaw cut stump?

The Research

Our friends in the Piedmont area of Georgia have done research to answer these questions, and their results may have application in the North. Research was done at two sites with differing species composition. Precut species composition at the first site was largely oak with fairly large components of hickory, dogwood, and sourwood. At the second site, the stands contained primarily sweetgum, oak, beech, dogwood, and yellow-poplar.

Although harvesting changed species composition, there was no difference due to harvest method. Species composition changes occurred with the same pattern whether the stems were sheared or cut with a chainsaw.

Shearing and chainsawing created stumps with very different appearances. Chainsaw-cut stumps had smooth-cut surfaces with little damage to the cambial surface between wood and bark. They were approximately 1/3 to 1/2 foot in height. Sheared stumps were irregularly shaped with noticeable separation of wood and bark and a rough crushed surface. Sheared stumps were cut just above groundline.

The Answers

A1. Planted pines grew best on sheared and herbicide-treated plots where competition and regrowth density per acre was least. Plots sheared with a Bobcat feller-buncher had significantly lower numbers of sprouts per acre than chainsawed plots, primarily because fewer stumps 3 inches in diameter and less sprouted on sheared plots. There was no reduction in the number of sprouts per stump on sheared plots. Sheared stumps that did sprout had as many stems as chainsawed stumps, but the total number of sprouts per acre was reduced because many small diameter sheared stumps did not sprout at all. Apparently, these stumps failed to sprout because of damage from the tracks of the Bobcat feller-buncher.

A2. Sheared stumps are significantly lower than chainsawed stumps. Consequently, sprouts from sheared stumps will likely be of better quality than those from chainsawed stumps because the sprouts are more firmly anchored at or below groundline. On higher chainsawed stumps, many dominant sprouts originated from the upper part of the stump, close to the cut surface. Here there is greater risk of decay and development of poor anchorage. Where a hardwood regrowth component is desired, sheared stumps appear to provide better quality hardwood stems.

A3. Tordon 101 herbicide was equally effective in reducing sprouting of both sheared and chainsawed stumps.

The Applications

A. If your post harvest stand prescription is artificial regeneration, harvesting by shearing rather than chainsaw cutting may reduce reforestation costs.

B. If your post harvest stand prescription is natural regeneration of quality hardwoods, harvesting by shearing rather than chainsaw cutting may increase the percentage of high quality sprouts in the new stand.

C. If your post harvest stand prescription is natural regeneration of hardwoods, and your objective is to have a dense stand of hardwood sprouts, harvesting by chainsaw cutting rather than shearing may be preferable.

2/ Article prepared by Arlyn W. Perkey based on information from "Chainsaw and Shear Cutting of Upland Hardwoods: Impact on Regeneration, Georgia Forest Research Paper 53, April 1984, Research Division, Georgia Forestry Commission, by Ansel E. Miller and Douglas R. Phillips.

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1986: THE YEAR OF THE SYMPOSIUM

In 1986 there will be a number of opportunities for foresters in the Northeastern Area to upgrade their technical skills by attending symposiums. The following listing may help you develop your 1986 training plan.

FORESTRY MICROCOMPUTER SOFTWARE SYMPOSIUM
Date: June 30-July 2, 1986
Contact: David G. Tangle
Program General Chairman
Forestry Software Symposium
P. O. Box 6125
Morgantown, West Virginia 26505-6125

MANAGING IMMATURE APPALACHIAN HARDWOOD STANDS
Date: May 28-30, 1986
Contact: Clay Smith
Timber and Watershed Laboratory
P. O. Box 404
Parsons, West Virginia 26287

MANAGING NORTHERN HARDWOODS
Date: June 22-25, 1986
Contact: Baird D. Hyland
Professor of Silviculture
College of Environmental Science and Forestry
Syracuse, New York 13210

THE NORTHERN HARDWOOD RESOURCE: MANAGEMENT AND POTENTIAL
Date: August 18-21, 1986
Contact: Glenn D. Mroz
School of Forestry and Wood Products
Michigan Technological University
Houghton, Michigan 49931

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+++++++ REMINDERS +++++++

The new silvicultural standards for the FORESTRY INCENTIVES PROGRAM (FIP) are effective October 1, 1985. Program evaluations done after that date will use the new standards to measure the effectiveness of individual sample cases. State Foresters have copies of these standards.

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The GROAK (GRow OAK) and GROPOP (GROw yellow POPlar) growth and yield programs are now available in microsoft BASIC for the Osborne Executive. Both programs are also available on the Radio Shack PC-2.
Contact: Arlyn W. Perkey